

Project No. 1251-100

Crude Oil Tank Farms Project, Agrood Area 30 (Module-1)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
1	Mechanical Completion Certificate (MCC)	
2	Ready for Startup Certificate (RFSU)	
3	System Punch Lists	
4	System Limits Marked Up P&ID	
5	System Index	
6	Piping Pre-Commissioning	
	6.01) Piping Test Packs	
	6.02) Piping Pre-commissioning Check Lists	
7	Piping Commissioning	
	7.01) Service Test, GLT, CLT and N2 Purging Certificates	
	7.02) Piping Commissioning Check Lists	
Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
8	Mechanical Pre-Commissioning	
	8.01) System Mechanical Index	
	8.02) Equipment Drawings	
	8.03) Equipment Datasheets	
	8.04) Boxing-up Certificates	

	8.05) Grouting Certificates	
	8.06) Pre-Alignment Certificates	
	8.07) Mechanical Pre-Commissioning Checklists	
9	Mechanical Commissioning	
	9.01) Final Alignment Certificates	
	9.02) Motor Solo Run Certificates	
	9.03) Mechanical Run Test (MRT) Certificates	
	9.04) Mechanical Commissioning Checklists	
	9.05) Mechanical Supplier Check Lists & Reports	
10	Instrumentation Pre-Commissioning	
	10.01) System Instrument Index	
	10.02) Instrument Data Sheets	
	10.03) Instrument Cable Schedule	
	10.04) System Instrumentation Wiring Diagram	
	10.05) Hook-up Drawing (Mechanical & Pneumatic)	
	10.06) Instruments Cables Schedule	
	10.07) Instruments Cables Laying Certificates	
	10.08) Instruments Cables Termination Certificates	
	10.09) Instruments Cables Testing Certificates	
	10.10) Instruments Calibration Certificates	
	10.11) Instrument Loop Checks Certificates	
	10.12) Instrumentation Pre-Commissioning Check Lists	
	10.13) Instrumentation Supplier Check Lists & Reports	
11	Instrumentation Commissioning	
	11.01) Instrumentation Function Test Certificates	
	11.02) Instrumentation Supplier Check Lists & Reports	
Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
12	Electrical Pre-Commissioning	
	12.01) System Electrical Index	
	12.02) Electrical Drawings	
	12.03) Motor Datasheets	
	12.04) Electrical Cables Schedule	
	12.05) Electrical Cables Laying Certificates	
	12.06) Electrical Cables Testing Certificates	
	12.07) Electrical Cables Termination Certificates	
	12.08) FAT Reports & Certificates	
	12.09) SAT Reports & Certificates	
	12.10) Electrical Pre-Commissioning Check Lists	
	12.11) Electrical Supplier Check Lists & Reports	

13	Electrical Commissioning	
	13.01) Electrical -Commissioning Check Lists	
	13.02) Electrical Supplier Check Lists & Reports	
14	Red Marked-up Drawings	
	14.01) P&ID	
	14.02) Instrumentation Drawings	
	14.03) Electrical Drawings	



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

1-Mechanical Completion Certificate (MCC)



SYSTEM MECHANICAL COMPLETION CERTIFICATE (MCC)

PROJECT TITLE : CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

PROJECT No : 01251-100

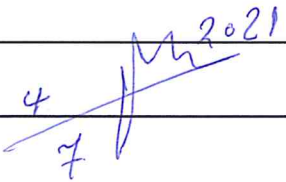
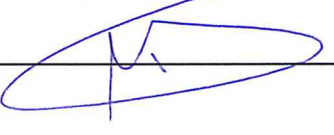
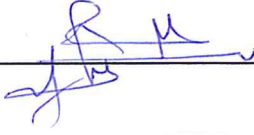
SYSTEM NAME : Tank-02 Cathodic Protection System

SYSTEM ID : 030-CP-003

THIS IS TO CERTIFY THAT:

- THE ABOVE SYSTEM HAS BEEN FABRICATED, ERECTED, INSTALLED AND TESTED TO THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS, THE APPLICABLE CODES AND STANDARDS.
- ALL PRE-COMMISSIONING RELEVANT ACTIVITIES, TESTS, INSPECTIONS AND CHECKS HAVE BEEN CARRIED OUT FOR THIS SYSTEM AND FOUND ACCEPTABLE.
- Q/C DOCUMENTATION OF THE ABOVE SYSTEM HAS BEEN AUDITED BY THE CUSTOMER SITE QUALITY CONTROL AND FOUND COMPLETED.
- ALL PUNCH LIST ITEMS CATEGORY (A) IN THIS SUBSYSTEM WERE CLEARED.
- THIS SYTEM IS MECHANICALLY COMPLETED ON THE DATE AND READY FOR COMMISSIONING (RFC) WITH THE FOLLOWING EXCEPTIONS.

EXCEPTIONS :

COMPANY	PETROJET	ENPPI	PMC
NAME	mostafa ibrahim	M. Abbar	
TITLE			
SIGNATURE			
DATE	4/7/2021		



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

2- Ready for Startup Certificate (RFSU)

READY FOR START UP CERTIFICATE

PROJECT TITLE : EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-02b)

PROJECT No. : 1251-100

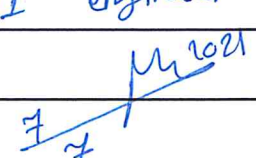
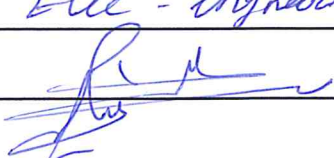
SYSTEM /AREA /PLANT : Tank-02 Cathodic Protection System

SYSTEM /AREA /PLANT No. : 030-CP-003

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS :

COMPANY	CONSORTIUM	PPC
NAME	Mostafa ibrahim	Mohamed Ibrahim
TITLE	E/I engineer	Elec - engineering
SIGNATURE		
DATE	7/7/2021	



READY FOR START UP CERTIFICATE

PROJECT TITLE : EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-02b)

PROJECT No. : 1251-100

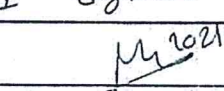
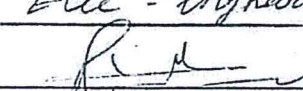
SYSTEM / AREA / PLANT : Tank-02 Cathodic Protection System

SYSTEM / AREA / PLANT No. : 030-CP-003

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM / AREA / PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS:

COMPANY	CONSORTIUM	PPC
NAME	Mostafa Ibrahim	Mohamed Ibrahim
TITLE	E/I engineer	Elec - engineering
SIGNATURE		
DATE	7/7/2021	



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

3- System Punch Lists



COMPANY	PTJ	ENPPI	PMC
NAME	Mostafa Ibrahim		
SIGN.			
DATE	4 / 11 / 2021		



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

4- System Limits Marked Up P&ID



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

5- System Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

6- Piping Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

6.01- Piping Test Packs



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

6.02- Piping Pre-commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

7- Piping Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

7.01- Service Test, GLT, CLT and N2 Purging Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

7.02- Piping Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8- Mechanical pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.01- System Mechanical Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.02- Equipment Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.03- Equipment Datasheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.04- Boxing-up Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.05- Grouting Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.06- Pre-Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

8.07- Mechanical Pre-Commissioning Checklists

System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9- Mechanical Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9.01- Final Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9.02- Motor Solo Run Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9.03- Mechanical Run Test (MRT) Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9.04- Mechanical Commissioning Checklists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

9.05- Mechanical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10- Instrumentation Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.01- System Instrument Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.02- Instrument Data Sheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.03- Instrument Cable Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.04- System Instrumentation Wiring Diagram



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.05- Hook-up Drawing (Mechanical & Pneumatic)



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.06- Instruments Cables Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.07- Instruments Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.08- Instruments Cables Termination Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.09- Instruments Cables Testing Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.10- Instruments Calibration Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.11- Instrument Loop Checks Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.12- Instrumentation Pre-Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

10.13- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

11- Instrumentation Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

11.01) Instrumentation Function Test Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

11.02- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12- Electrical Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.01- System Electrical Index

030-CP-003

Tank-02 Cathodic Protection System

Cathodic Protection

EPC BY PTJ

EPC BY PTJ

N/A

EPC BY PTJ

Form Type

Check Forms ID



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.02- Electrical Drawings

SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

SUPPLIER'S NAME :	Petrojet
PURCHASE ORDER No :	01251-100-116-2-Q
DOCUMENT TITLE :	External Cathodic Protection system drawing for Crude Oil Storage Tanks
TOTAL No OF PAGES :	Cover +1
SUPLLIER'S ORDER No :	

SUPPLIER'S OWN DOCUMENT No	SUPPLIER'S REVISION	DATE	SUPPLIER APPROVAL SIGNATURE
2019/CRUDE OIL-ALL TANKS-30-D-3-CP-01	0	010., 9, 2019	Magdy
	1	18/9/2019	Magdy
	2	30/9/2019	Magdy

SUPPLIER DOCUMENT REVIEW

PROJECT TITLE : EGPC Crude Oil Tank FARM

PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

ENPPI PROJECT NUMBER : 01251-100

PACKAGE DESCRIPTION : Crude Oil Storage Tank

☒ 1. WORK MAY PROCEED.

EQUIPMENT TAG : XX-T-01/2/3/4 -All Tank

☐ 2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.

CODE IDENTIFIER : D99

☐ 3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED.

☐ 4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT).

☐ 5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT).

DOCUMENT NUMBER

REV

NAME: Ahmed Kamal Abu ElMagd

1251-100-116-02-XX-D99-022

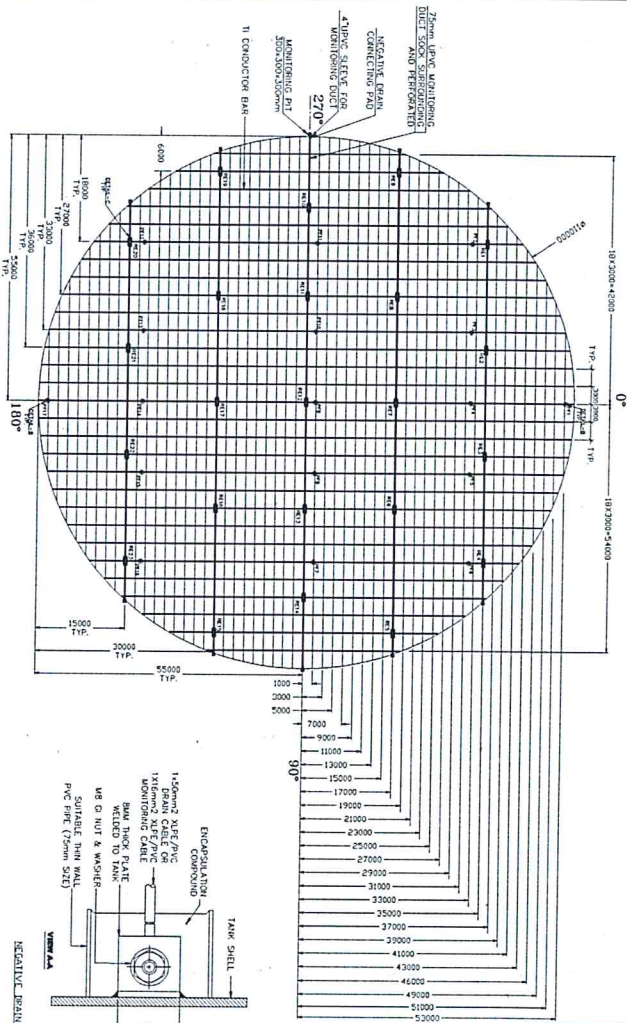
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SIGNATURE: A. Elmagd

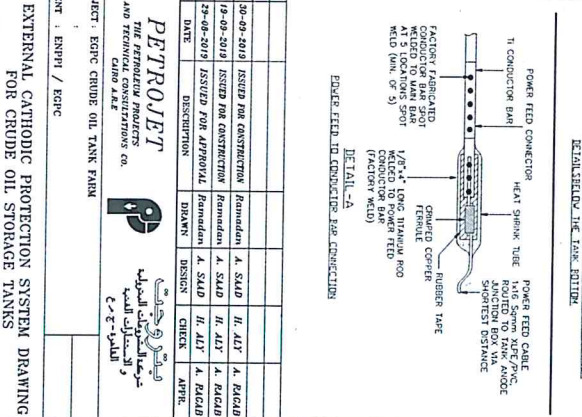
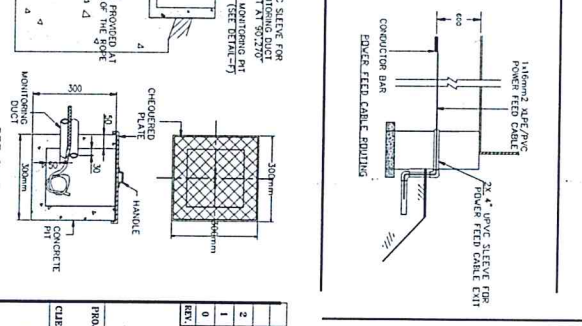
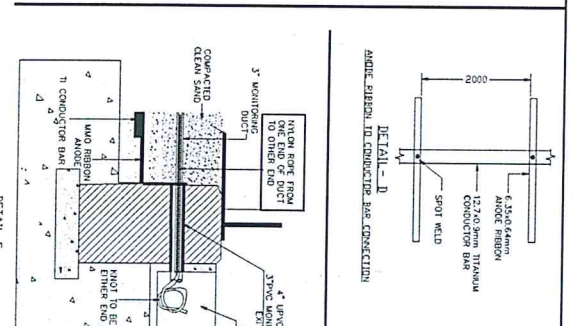
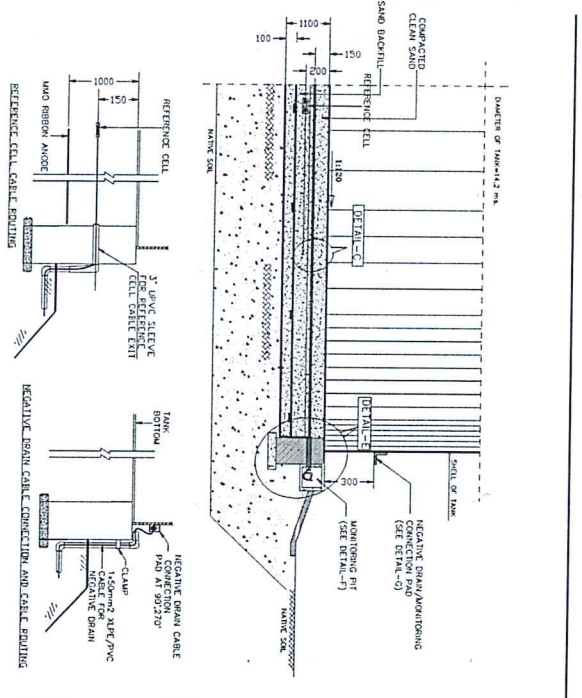
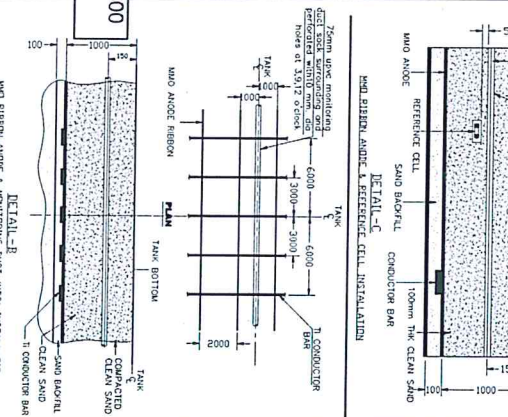
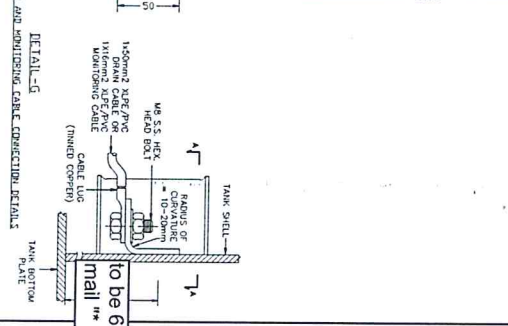
DATE: Oct. 01, 2019

Code 1

10000-Z-000-PM1-FRM-0033 (11/14)



NOTES:-
To avoid clashes for the tank items below tank (including tank sump / piping) with anodes grid system (model) for these items shall be installed prior to installation of the anode ribs to ensure that the anode system does not clash with any item.



REV.	DATE	DESCRIPTION	DRAWN	CHECK	APPR.
1	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
2	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
3	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
4	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
5	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
6	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
7	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
8	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
9	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI
10	19-09-2019	ISSUED FOR CONSTRUCTION	Remandan	A. SAUD	H. ALI

PROJECT: EXTERNAL CATHODIC PROTECTION SYSTEM FOR CRUDE OIL STORAGE TANKS
DWG. NO. 1251-10-116-02-XX-099-022
SHEET NO. 1/1

SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

SUPPLIER'S NAME :	Petrojet
PURCHASE ORDER No :	01251-100-116-2-Q
DOCUMENT TITLE :	External Cathodic Protection Schematic Layout for Crude Oil Storage Tanks
TOTAL No OF PAGES :	Cover +1
SUPPLIER'S ORDER No :	

SUPPLIER'S OWN DOCUMENT No	SUPPLIER'S REVISION	DATE	SUPPLIER APPROVAL SIGNATURE
2019/CRUDE OIL-All Tank--30-D-3-CP-03	0	010., 9, 2019	Magdy
	1	18/9/2019	Magdy

SUPPLIER DOCUMENT REVIEW	PROJECT TITLE : EGPC Crude Oil Tank Farm			
<p>PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.</p> <p>1. WORK MAY PROCEED.</p> <p>2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.</p> <p>3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED.</p> <p>4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT).</p> <p>5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT).</p>	ENPPI PROJECT NUMBER : 01251-100			
	PACKAGE DESCRIPTION : Crude Oil Storage Tank			
	EQUIPMENT TAG : XX-T-01/2/3/4 -All Tank			
	CODE IDENTIFIER : C99			
	<table> <tr> <th>DOCUMENT NUMBER</th><th>REV</th></tr> <tr> <td>1251-100-116-02-XX-D99-024</td><td>0</td></tr> </table>	DOCUMENT NUMBER	REV	1251-100-116-02-XX-D99-024
DOCUMENT NUMBER	REV			
1251-100-116-02-XX-D99-024	0			
NAME: Ahmed Kamal Abu ElMagd				
SIGNATURE: A. ElMagd	DATE : Sept. 26, 2019			

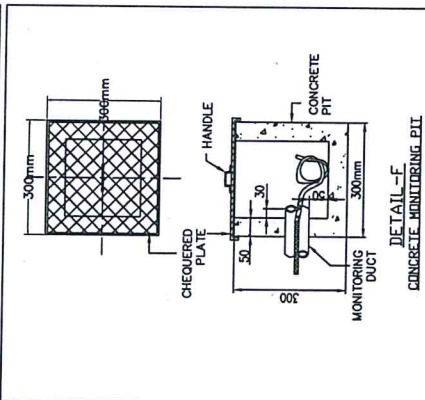
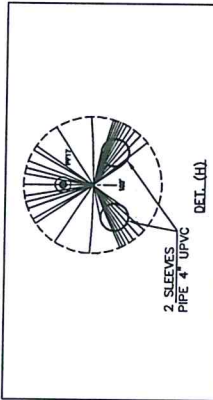
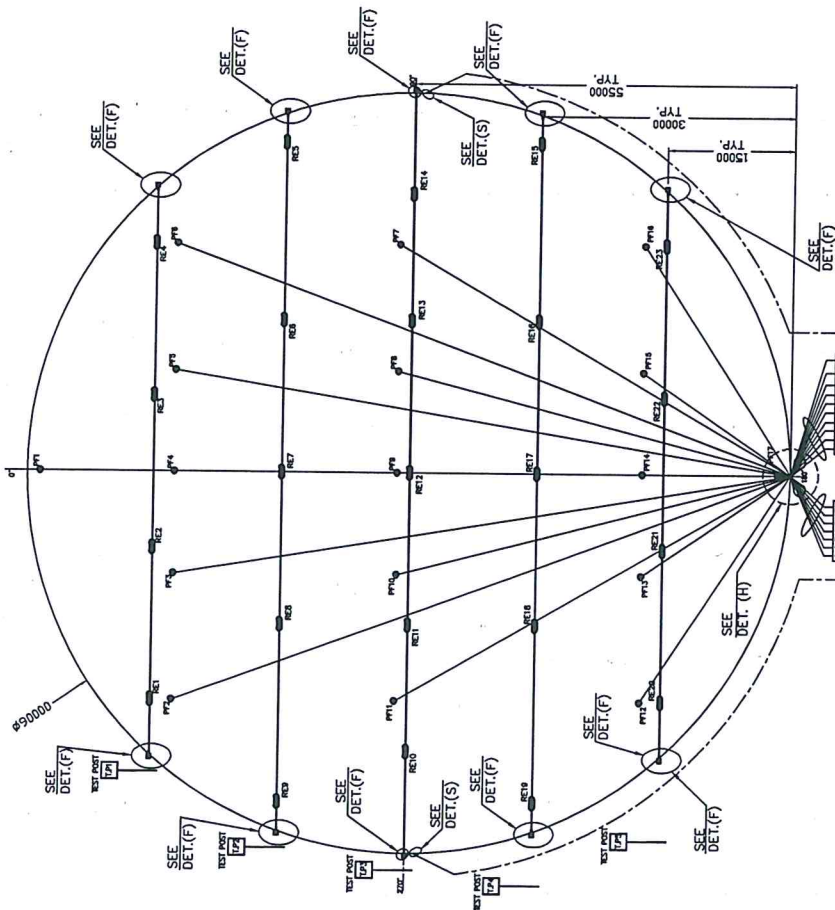
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10000-Z-000-PM1-FRM-0033 (11/14)

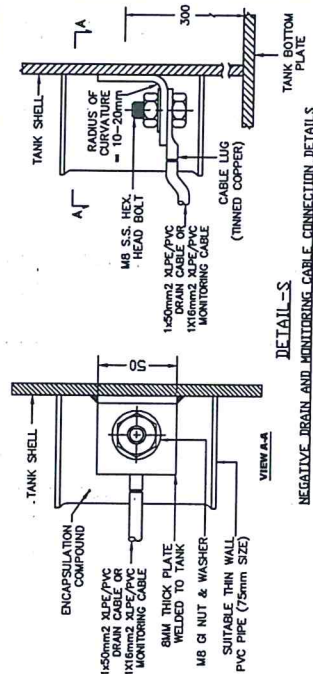
NOTE:

- TR UNIT - TRANSFORMER RECTIFIER UNIT
- AJB - ANODE JUNCTION BOX
- TP(1 TO 5)- TEST POST
- PF(1 TO 17)- POWER FEEDS
- RE(1 TO 23)- REFERENCE ELECTRODE
- POSITIVE HEADER CABLE
- NEGATIVE HEADER CABLE
- TR UNIT - TRANSFORMER RECTIFIER UNIT

- ANY CLASHES SHALL BE AVOIDED AT SITE DURING INSTALLATION.



DETAIL - F
CONCRETE MONITORING PIT



DETAIL - S
NEGATIVE DRAIN AND MONITORING CABLE CONNECTION DETAILS

NO.	DATE	REVISION	BY	CHKD	APPD
1	15-06-2019	DESIGNED FOR CONSTRUCTION	SHAMSHAD A. ALI	SHAMSHAD A. ALI	SHAMSHAD A. ALI
2	15-06-2019	REVISED FOR APPROVAL	SHAMSHAD A. ALI	SHAMSHAD A. ALI	SHAMSHAD A. ALI
3	15-06-2019	REVISION	SHAMSHAD A. ALI	SHAMSHAD A. ALI	SHAMSHAD A. ALI




PROJECT: 80PC CRUDE OIL TANK TANK

CLIENT: ENPP / ENPC

EXTERNAL CATHODIC PROTECTION SCHEMATIC LAYOUT
FOR CRUDE OIL STORAGE TANKS

SCALE: 1/1	DATE: 15-06-2019	DWG. NO.: 1251-106-02-XI-098-024	REVISION: 1/1
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	Doc. no.:	CR35913 – II01	Rev. No.:	0
	Doc. Title:	II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION	Page:	5 of 15

Please refer to the project drawing "Doc number 1251-100-116-002-D99-005 External Cathodic Protection Permanent Reference Electrode Installation drawing for Fire Water Storage Tanks" for precise location / orientation of these pipes.

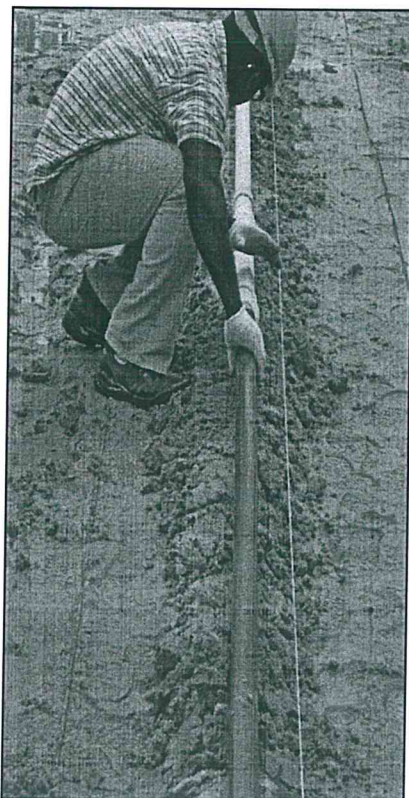
The slotted pipe will have a galvanized steel rope passed through entire length of the pipe as it is being assembled and terminated at each end to be used a draw cord The rope is tied wrapped to the Portable Cu/CuSO₄ reference electrode which in turn has a 120m cable tail to allow passage under the entire tank base. When not in use the cable tail / Galvanised steel wire should be safely coiled and stored in the monitoring pits provided.

The PVC is pipe is supplied in 3 to 5.8m lengths and is joined by M/F threaded connection.


The geotextile sleeve is provided loose to be fitted during construction to prevent the backfill media from entering the slotted tube.

For the portable cell to operate successfully it is suggested to wrap in a wet sponge material creating an interference fit within the PVC tube.

Ensure the insulation of the cables is not damaged during the pulling of the cables.



The slotted monitoring pipe should be laid on a sand bank running across the tank base 150mm above the MMO Grid and then routed through the 4" conduit at plant east and west side of the ring beam.

	Doc. no.:	CR35913 – II01	Rev. No.:	0
	Doc. Title:	II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION	Page:	7 of 15

5.2 MMO RIBBON & CONDUCTOR BAR

Please refer to:

Document Number 1251-100-116-02-XX-D99-022 External Cathodic Protection System Drawing For Crude Oil Storage Tank

Document Number 1251-100-116-002-D99-004 External Cathodic Protection System Drawing For Fire Water Storage Tank

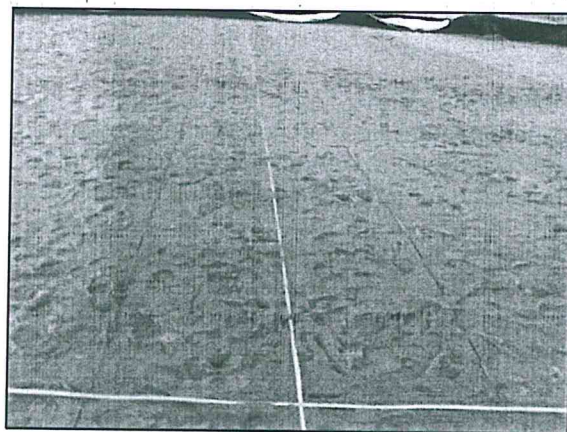
For the successful operation of the Cathodic Protection system, it is imperative that the MMO Ribbon is installed at a uniform minimum depth of 600mm below the tank bottom.

The foundations of the tanks shall be constructed to the point where they would be at least 350 to 400mm (layer of soft sand) below the bottom of the tank. It must be noted that the MMO Ribbon anodes and conductor bar assembly **MUST** be placed above the membrane.


The membrane should be at 100mm below the proposed location of MMO ribbon grid. In addition, it is essential that the membrane shall cover the entire inner face of the concrete ring beam foundations to isolate the reinforcing rebar from the anode network. The Civil Contractor shall confirm the membrane is a uniform 700 mm depth below the proposed bottom of the tank, before proceeding further.

A 100mm layer of chloride free, clean washed sand shall be installed directly above the membrane, which shall be compacted according to the project standard and the anode shall be installed on this layer. The pattern of the anodes and conductor bar shall be as shown in the referenced drawings.

The anode ribbon shall be placed onto the sand layer in the pattern shown in the relevant design drawing, and then the Titanium conductor bars laid out. Where appropriate, the anodes shall be weighted down to avoid movement however, great care shall be taken to ensure that the coating of the anodes is not scratched or damaged in any way.



Grid style layout of anode ribbon and conductor bars

	Doc. no.:	CR35913 – II01	Rev. No.:	0
	Doc. Title:	II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION	Page:	8 of 15

The spot welder, provided shall be used for all welds and shall be operated in accordance with the manufacturer's Operation Manual by an experienced operative – see appendix 2 for operation instructions.

A sample test weld between the anode ribbon and conductor bar should first be carried out in order to ensure good quality welds. A pull test (by hand) to ensure the weld cannot be pulled apart. A resistance test between the welded element shall be carried to ensure the weld integrity. The acceptance criteria for the resistance between the welded elements shall be 0.1ohm using a calibrated multimeter.



MMO Ribbon anode spot welded to titanium conductor

The sample spot weld shall be inspected by a Cathodic Protection Engineer or other responsible authorised person.

Each weld carried shall be tested with a pull test (by hand) and have a resistance test carried out. The results shall be recorded. The settings on the spot welder unit should be also recorded.

The recommended setting is as follows:

- MMO ribbon anode to MMO ribbon anode: 2 seconds.
- MMO ribbon anode to Titanium conductor bar: 3 seconds
- Titanium conductor bar to Titanium conductor bar: 5 seconds

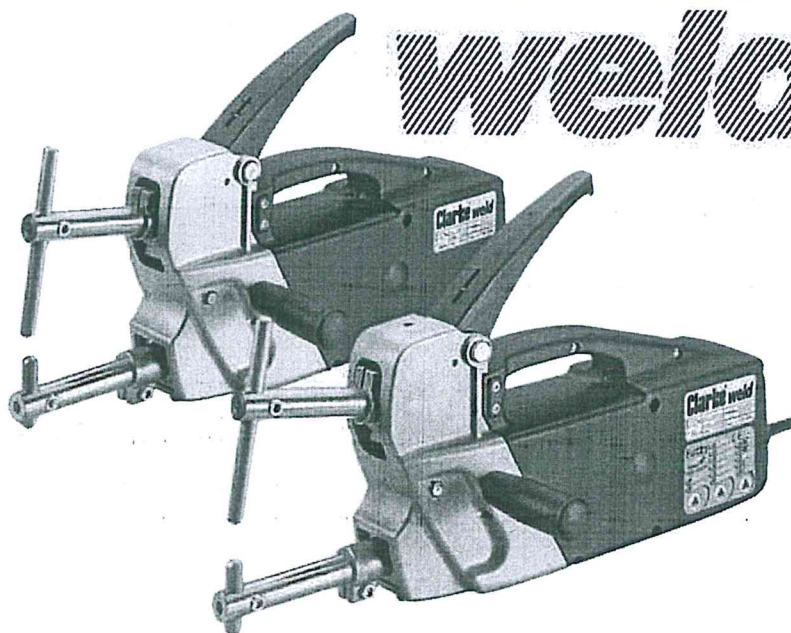
At each and every crossover of the anode ribbon with the conductor bar, the anode shall be resistance welded, (spot welded) to the conductor bar a minimum of twice. Where necessary, anodes and conductor bars shall be extended using the same procedure.

5.3 POWERFEED CONNECTORS

The power feed connection locations shall be identified as per the reference drawings.

Power feed connectors are factory connected to the 16mm² cable using a splice kit. The Conductor bar tail from the power feed cable encapsulation shall be connected to the conductor

Clarke[®] weld



SPOT WELDER

Models CSW6T & CSW13T

Part Nos. 6030006 & 6030010

0204

OPERATING & MAINTENANCE INSTRUCTIONS

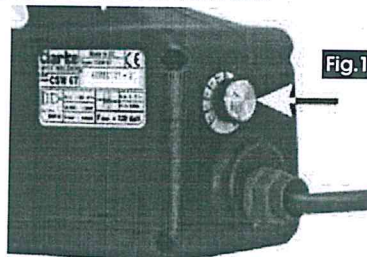


FEATURES

Model CSW6T

This 230V 50Hz, portable Spot Welder is provided with an electronic timer which allows precise control of welding time. The control knob is arrowed in Fig. 1.

Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 1 + 1 mm in thickness.

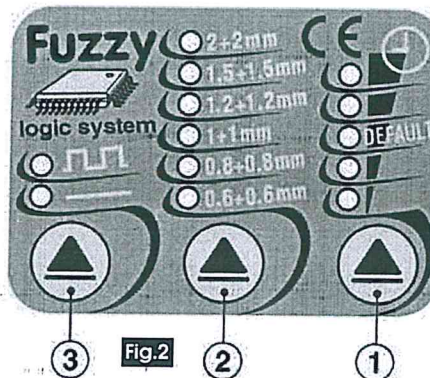


Model CSW13T

The most important features of this 230V 50Hz Portable Spot Welder are controlled by a microprocessor, managed from the control panel, shown in Fig. 2. These features are:

1. Welding time, set according to the thickness of metal to be welded.
2. Changing selection for Welding thickness
3. Changing resistance welding machine operating mode... normal or pulse.

Selecting 'PULSE' mode improves welding capacity on material with high yield points or materials with protective coatings. The pulsation period is preset and does not require adjustment.



4. Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 2 + 2 mm in thickness.

Both Models

- 120mm Electrode Arms and standard electrodes are provided.
- An eye bolt may be fitted to the machine (see your Clarke dealer), for use in supporting the machines weight when repetitive welds are required (see your Clarke dealer). **IMPORTANT! When using the Eye Bolt, Take care NOT to screw it more than 8mm into the screw hole.**

UNPACKING & PARTS IDENTIFICATION

Unpack and lay out the components, checking against the following list. Please report any damage which may have occurred during transit, to your CLARKE dealer immediately.

- | | |
|----------------------------------|--------------------------|
| 1. Welder complete. | 5. 2 x Hex. Wrenches - D |
| 2. 1 x Handle - A | 6. 1 x M6 Screw - F |
| 3. 2 x Electrode Holders - B | |
| 4. 2 x Electrodes (straight) - C | |

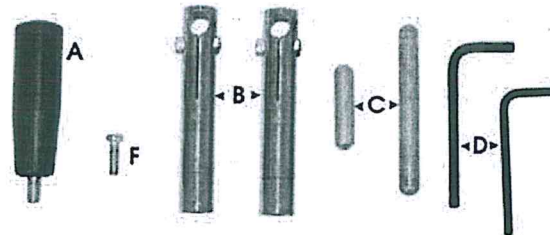


Fig.3

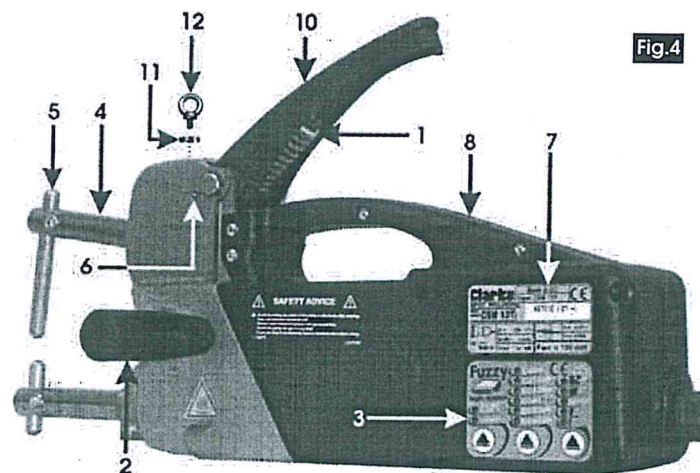
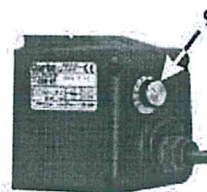


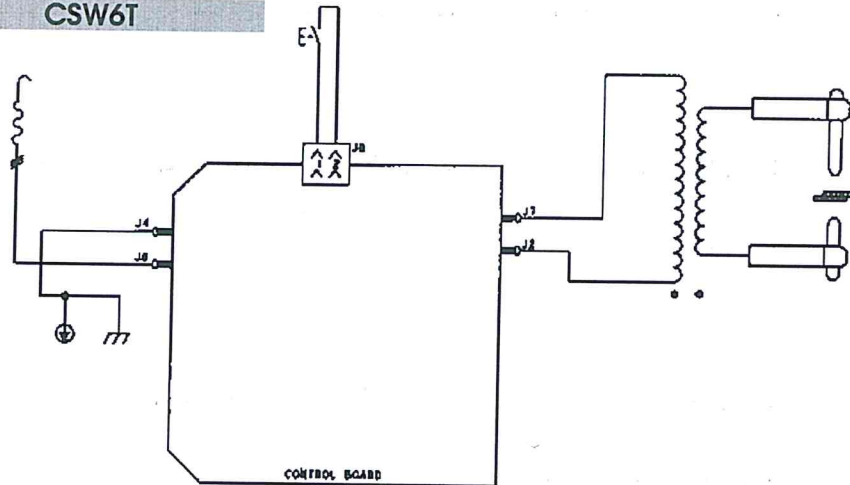
Fig.4

- | | |
|----------------------------|----------------------------|
| 1. Pressure Adjuster screw | 7. Data Label |
| 2. Handle | 8. Microswitch |
| 3. Control panel (13T) | 9. Weld Time Adjuster (6T) |
| 4. Electrode Arm | 10. Operating Lever |
| 5. Electrode (Long) | 11. Spacer (Optional) |
| 6. Screw Locating Hole | 12. Lifting Eye (optional) |

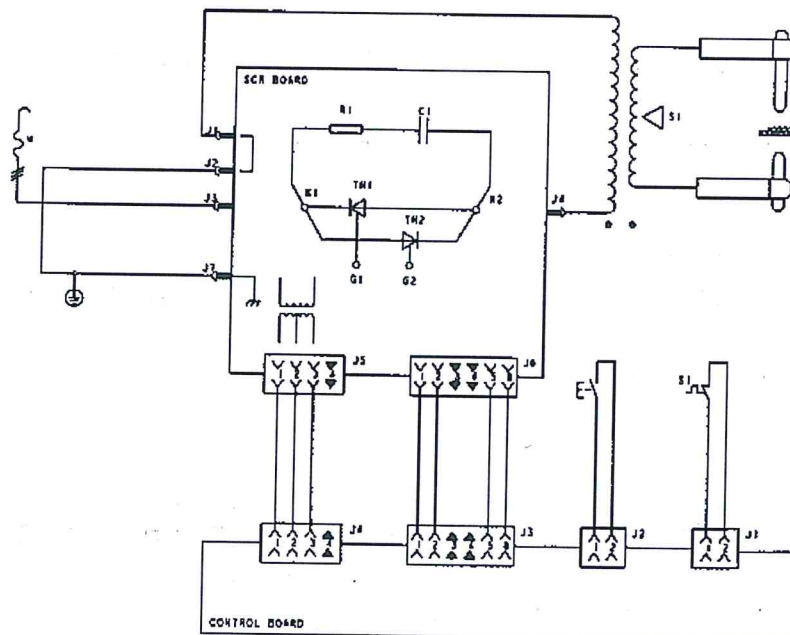


SCHEMATIC WIRING DIAGRAMS

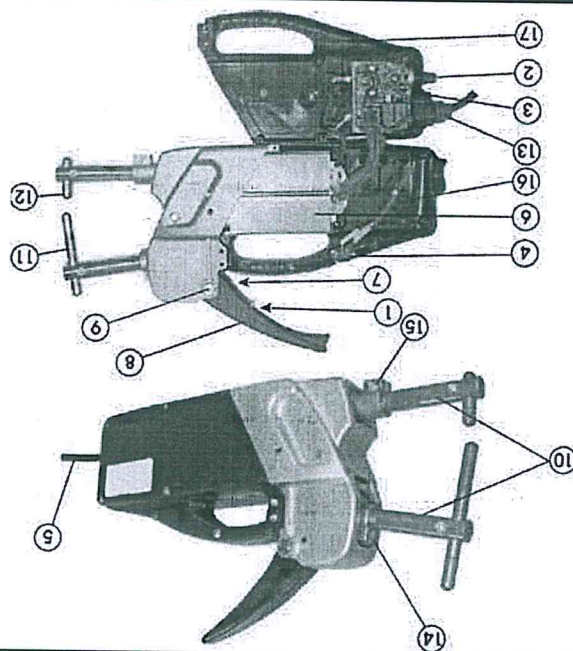
CSW6T



CSW13T

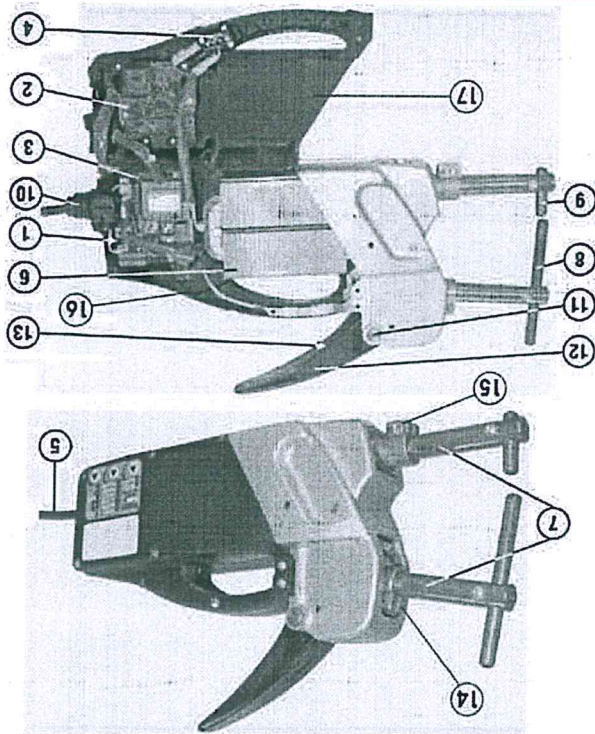


SPARE PARTS - CSW6T

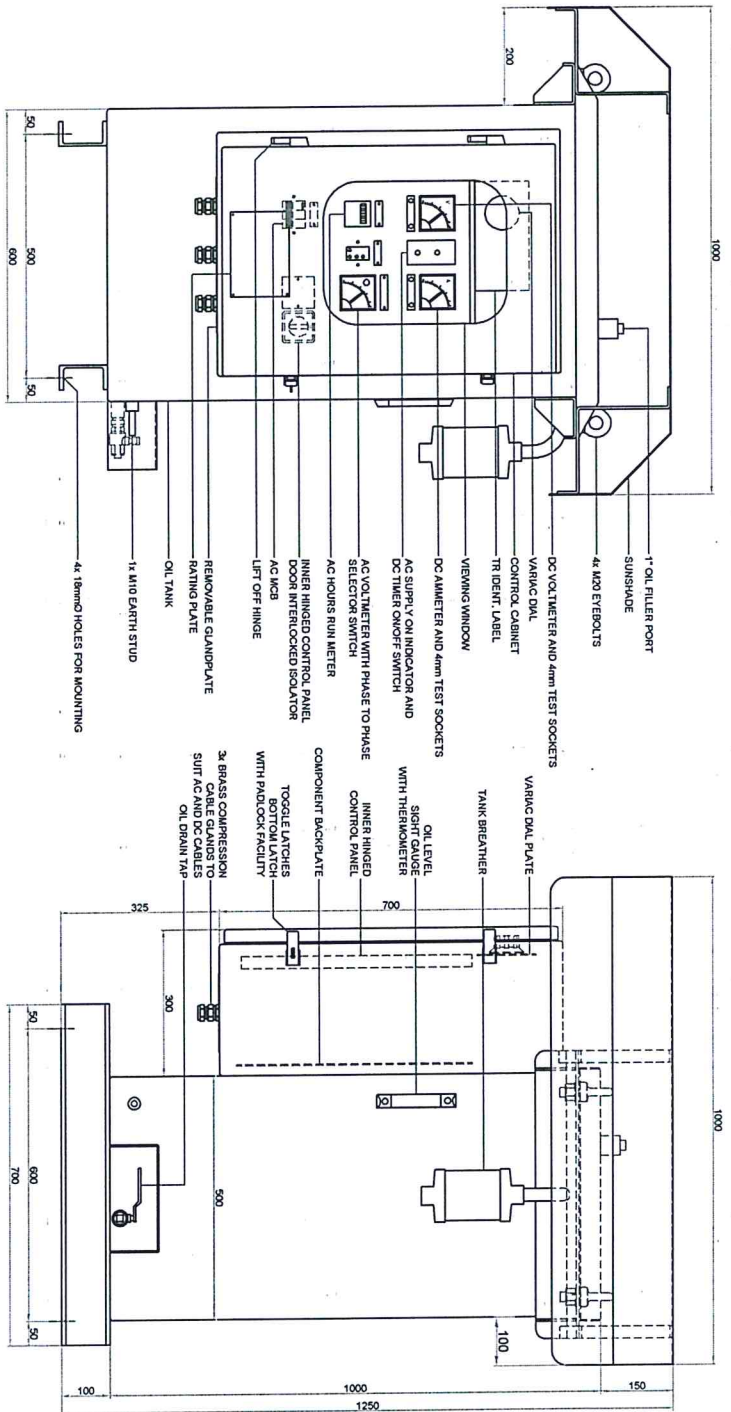


No.	Description	No.	Part Number
1	Bush	1	TT322518
2	Potentiometer (Adjuster) Knob	1	TT112299
3	Timer PCB	1	TT114236
4	Microswitch	1	TT122393
5	Mains Cable	1	TT132104
6	Transformer	1	TT169152
7	Adjuster Screw	1	TT121263
8	Operating Lever	1	TT322512
9	Pivot Pin	1	TT482887
10	See Page 13 for full range of Arms		
11	See Page 13 for full range of Electrodes		
12	See Page 13 for full range of Electrodes		
13	Cable Kit - Bushing, Ring Nut	1	TT990046
14	Upper Arm Clamp	1	TT522020
15	Lower Arm Clamp	1	TT522023
16	Left Shell	1	TT322509
17	Right Shell	1	TT322526

SPARE PARTS - CSW13T



No.	Description	No.	Part Number
1	Screw	1	TT113908
2	Control PCB	1	TT114070
3	Power PCB	1	TT114085
4	Microswitch	1	TT122393
5	Mains Cable	1	TT132104
6	Transformer	1	TT169034
10	Cable Kit - Bushing, Ring Nut	1	TT990046
11	Pivot Pin	1	TT482887
12	Operating Lever	1	TT322512
13	Adjuster Screw	1	TT212163
14	Upper Arm Clamp	1	TT522020
15	Lower Arm Clamp	1	TT522023
16	Right Shell	1	TT322510
17	Left Shell	1	TT322511



MANUFACTURED FROM
TANK 3mm MILD STEEL SHEET
CABINETS AND SUNSHADE 2.0mm MILD STEEL SHEET
INGRESS PROTECTION IP65

FINISH: (SUITABLE FOR HARSH MARINE ENVIRONMENT CS-M)
SHOTBLAST SA&S
EXTERNAL SURFACES INCLUDING
DOOR LATCHES AND MOUNTING
INTERIOR APPROX EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

INTERNAL SURFACES
DOOR LATCHES AND MOUNTING
INTERIOR APPROX EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

COLOR: ALL SURFACES: DARK GREY

0	FOR APPROVAL	11.10.19	AA
REV.	DESCRIPTION	DATE	APPROVED

PROJECTION		FOR APPROVAL	
FOR CUSTOMER USE ONLY			

APPROVED: ☐ DATE: _____

NAME: _____

SIGNED: _____

BAC
CORROSION CONTROL
www.bacgroup.com

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PROJECT: CR35913

TITLE: GENERAL ARRANGEMENT DRAWING
VARIAC CONTROL, TRANSFORMER RECTIFIER
AC SUPPLY 400V 3PH 50HZ
DC OUTPUT 50V 50A
PH

MATERIAL: -

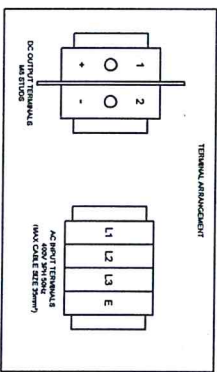
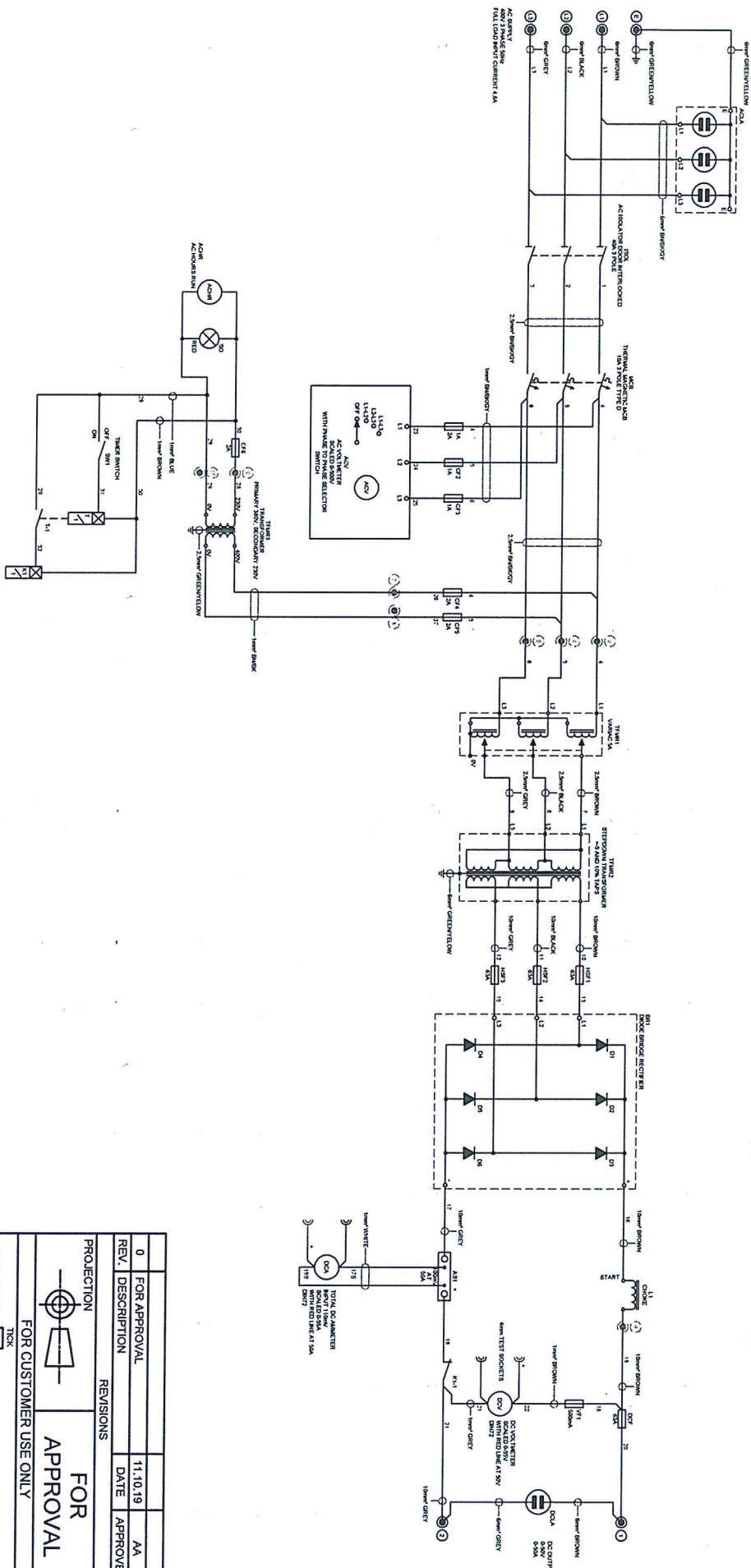
APPROX WEIGHT (KG): -

QUANTITY: 7

NAME: _____ DATE: _____

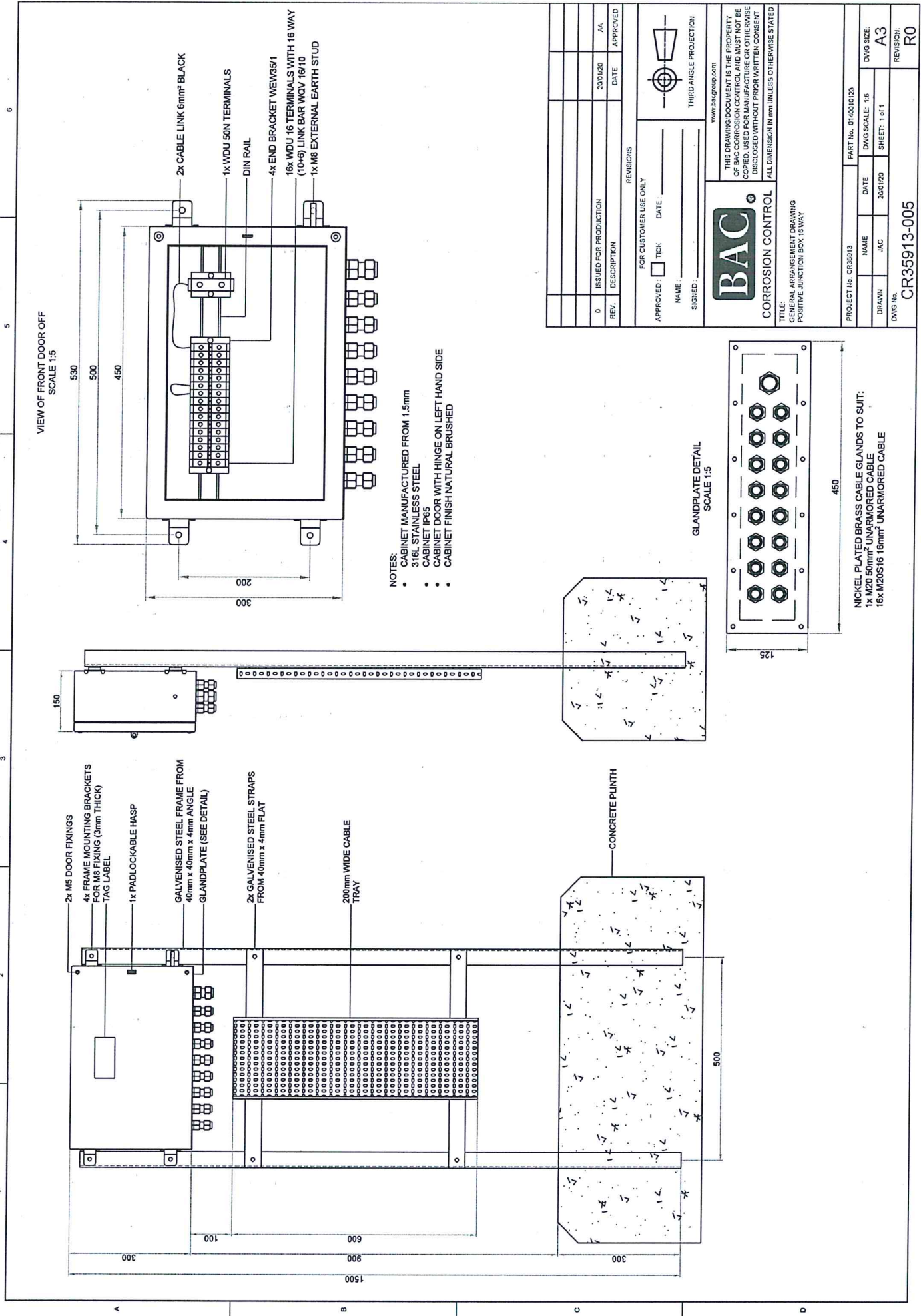
DRAWN: JAC 11.10.19 SHEET 1 OF 1 SCALE: 1:10 A3

DWG NO: CR35913-003 REVISION: -R0

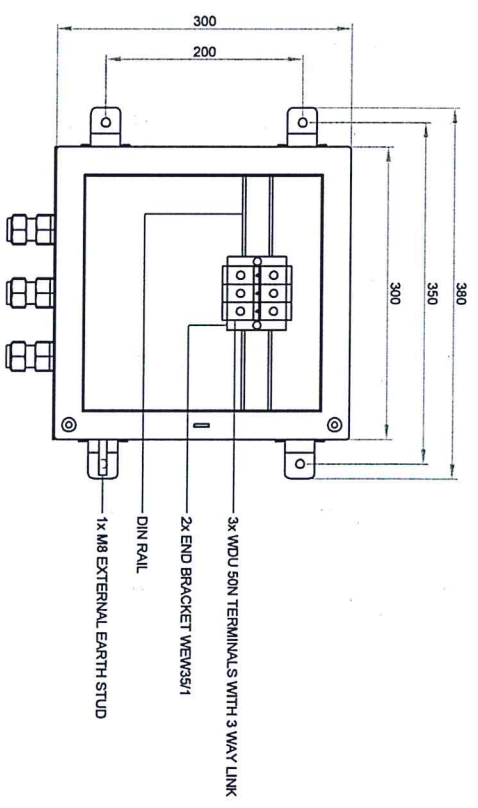
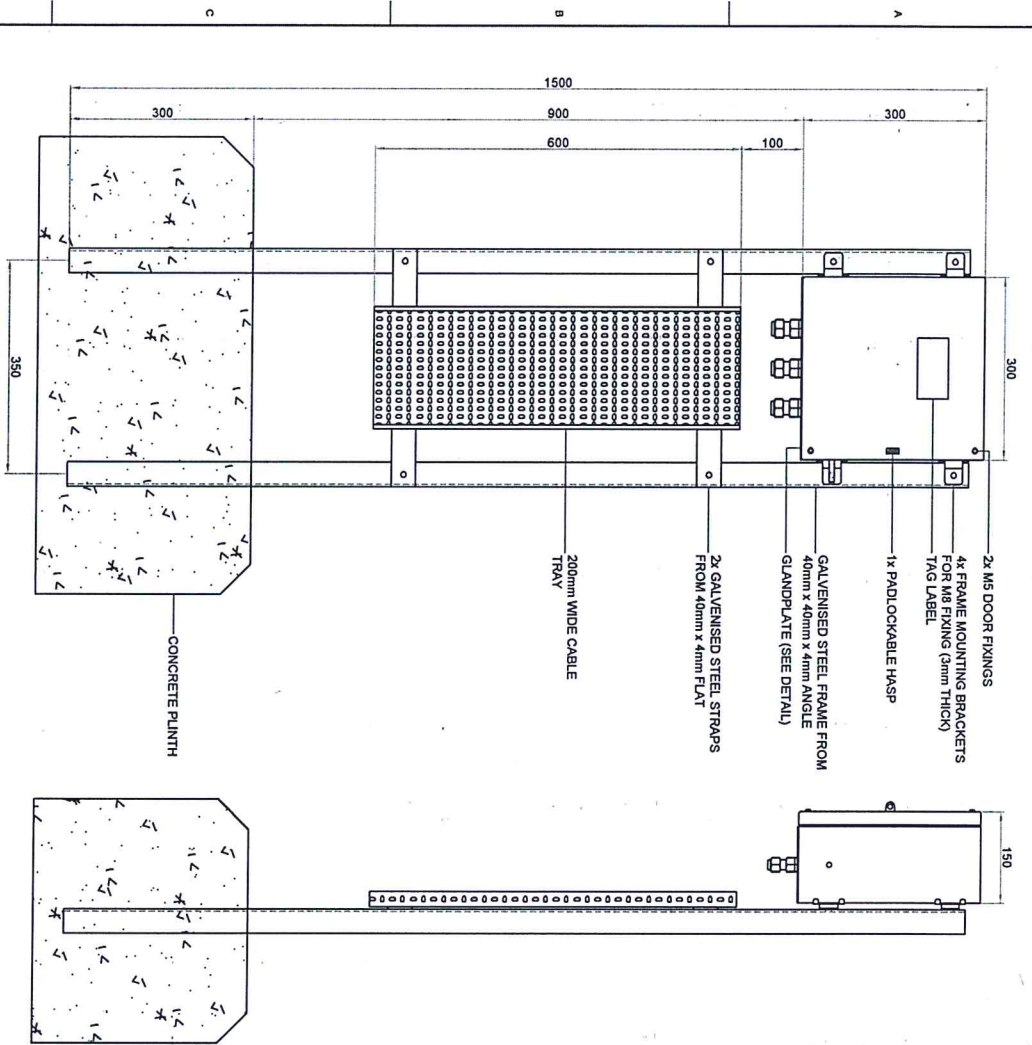


NOTE: TO BE USED IN A 250V 20A SUPPLY FOR A TYPICAL APPLICATION. THE THERMAL WARNING LABEL MUST BE USED ON THE CONTROL CABLE. THE THERMAL WARNING LABEL MUST BE USED ON THE CONTROL CABLE. THE THERMAL WARNING LABEL MUST BE USED ON THE CONTROL CABLE.

0 FOR APPROVAL		11.10.19		AA	
REV	DESCRIPTION	DATE	APPROVED		
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<div style="text-align: center;"> FOR CUSTOMER USE ONLY </div>					
APPROVED: <input type="checkbox"/> TICK DATE: _____ NAME: _____ SIGNED: _____					
<div style="text-align: center;"> BAC </div>					
THE DRAWING IS THE PROPERTY OF BAC. IT IS TO BE USED FOR THE MANUFACTURE OF BAC EQUIPMENT ONLY. IT IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF BAC.					
PROJECT: CR35913 TITLE: SCHEMATIC DIAGRAM RECTIFIER AC SUPPLY 250V 20A DC OUTPUT 50V 500mA					
APPROX WEIGHT (KG): _____ QUANTITY: 8					
NAME		DATE		FINISH	
DRAWN		11.10.19		SHEET 1 OF 1	
JAC		SCALE		A3	
DWG NO.		CR35913-004		REVISION: -R0	

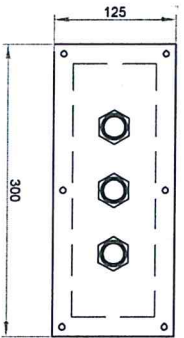


REV.		DESCRIPTION		DATE		APPROVED	
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REVISIONS				FOR CUSTOMER USE ONLY			
APPROVED: <input type="checkbox"/> TCK				DATE: _____			
NAME: _____				SIGNED: _____			
THIRD ANGLE PROJECTION				www.bacgroup.com			
BAC				THIS DRAWING DOCUMENT IS THE PROPERTY OF BAC CORROSION CONTROL AND MUST NOT BE REPRODUCED OR COPIED WITHOUT PERMISSION. DISCLOSED WITHOUT PRIOR WRITTEN CONSENT.			
CORROSION CONTROL				ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED			
TITLE: GENERAL ARRANGEMENT DRAWING POSITIVE JUNCTION BOX 16 WAY				PROJECT No. CR35913 PART No. 0140210123			
DRAWN: JAC		NAME: JAC		DATE: 20/12/20		DWG SCALE: 1:5	
DWG No. CR35913-005		SHEET: 1 of 1		DWG SIZE: A3		REVISION: R0	



- NOTES:
- CABINET MANUFACTURED FROM 1.5mm
 - 316L STAINLESS STEEL
 - CABINET IP65
 - CABINET DOOR WITH HINGE ON LEFT HAND SIDE
 - CABINET FINISH NATURAL BRUSHED

GALDPLATE DETAIL
SCALE 1:5



NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
3x M20 50mm² UNARMORED CABLE

VIEW OF FRONT DOOR OFF
SCALE 1:5

PROJECT NO. CR35913		PART NO. Q14601025	
NAME	DATE	DWG SCALE: 1:5	DWG SIZE: A3
DRAWN	JAC	2001/20	SHEET: 1 of 1
REVISION:		R0	

REV.	DESCRIPTION	DATE	APPROVED
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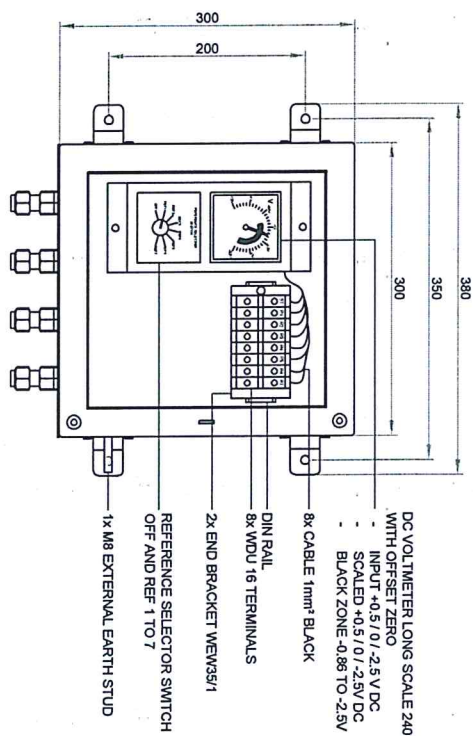
FOR CUSTOMER USE ONLY	
APPROVED: <input type="checkbox"/> TCK	DATE: _____
NAME: _____	SIGNED: _____
THIRD ANGLE PROJECTION	

BAC

CORROSION CONTROL

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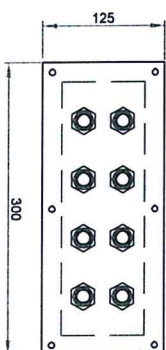
GENERAL ARRANGEMENT DRAWING
NEGATIVE JUNCTION BOX 3 WAY



VIEW OF FRONT DOOR OFF
SCALE 1:5


- NOTES:
- CABINET MANUFACTURED FROM 1.5mm
- 316L STAINLESS STEEL
- CABINET IP65
- CABINET DOOR WITH HINGE ON LEFT HAND SIDE
- CABINET FINISH NATURAL BRUSHED

GLANDPLATE DETAIL
SCALE 1:5



**NICKEL PLATED BRASS CABLE GLANDS TO SUIT
8x M20S16 10mm² UNARMORED CABLE**

PROJECT No. CR35913		PART No. 016001025	
DRAWN	NAME	DATE	DWG SCALE: 1:6
JAC		3/30/20	
		SHEET 1 of 1	
DWG No.		REVISION:	DWG SIZE:
CR35913-008		R0	A3

<p>TITLE:</p> <p>GENERAL ARRANGEMENT DRAWING</p> <p>TEST POST 7WAY</p>		<p>DATE: _____</p> <p>TEST POST 7WAY</p>
<p>CORROSION CONTROL</p> <p>BAC</p> <p>ALL DIMENSION IN mm UNLESS OTHERWISE STATED</p>		<p>THIS DRAWING DOCUMENT IS THE PROPERTY OF BAC CORROSION CONTROL, AND MUST NOT BE COPIED, USED FOR MANUFACTURE OR OTHERWISE DISCLOSED WITHOUT PRIOR WRITTEN CONSENT.</p> <p>www.bacgroup.com</p>
<p>APPROVED: <input type="checkbox"/> TCK</p> <p>NAME: _____</p> <p>SIGNED: _____</p>		<p>DATE: _____</p> <p>THIRD ANGLE PROJECTION</p> 

FOR CUSTOMER USE ONLY	
REV.	DESCRIPTION
0	ISSUED FOR PRODUCTION
3/30/20	AK
DATE	APPROVED

MIXED METAL OXIDE ANODES RIBBON TYPE POWER FEED CONNECTION KIT

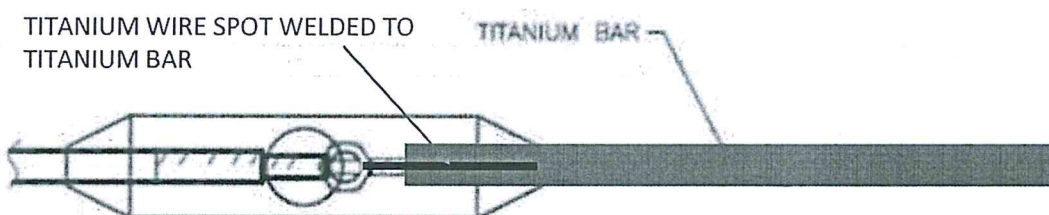
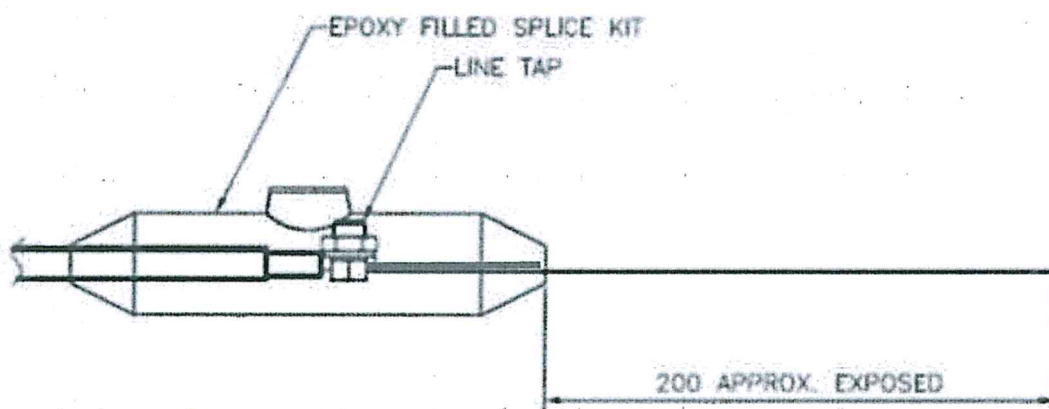
DATASHEET 1.11

POWER FEED
CONNECTOR



APPLICATION : For power feed connections on under tank grid anode system. The power feed connector connects the DC current feeder cable to the Titanium Conductor Bar.

Anode Power Feed Connector comprises 12.7mm width x 0.9mm Thickness x 200mm length Titanium Conductor Bar spot welded to a 100mm length of 3mm dia Titanium Wire. Encapsulation to the DC feeder cable is made by an epoxy splice kit and line tap connector generally as detailed below



Quantity : 551 No (for Crude Oil Tanks)
Powerfeed Connectors supplied with 500m of 16mm² XLPE/PVC Cable Tail , Colour Red

Quantity : 77 No (for Fire Water Tanks)
Powerfeed Connectors supplied with 160m of 16mm² XLPE/PVC Cable Tail , Colour Red

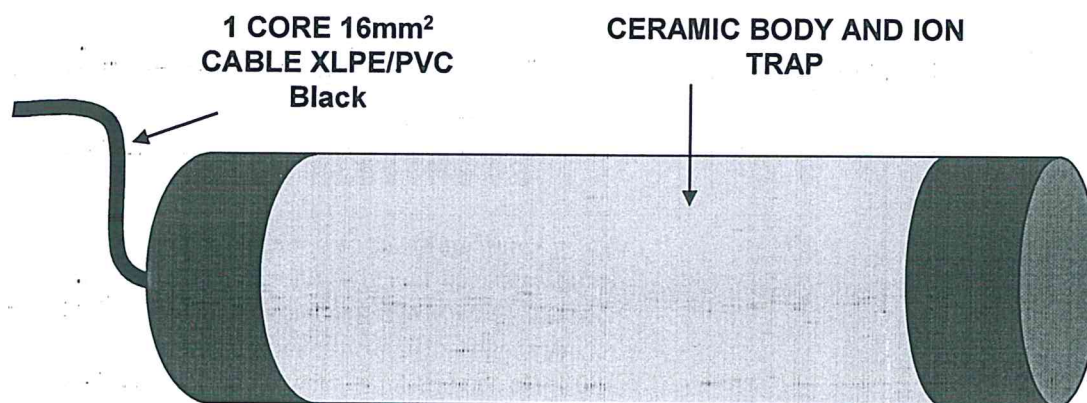


PERMANENT COPPER / COPPER SULPHATE REFERENCE ELECTRODE

This permanent reference electrode is used to measure Cathodic Protection (CP) potentials on buried pipelines, storage tanks and other buried metallic structures to which CP has been applied. Can be used with a pipeline coupon that allows you to take an IR free potential reading without interruption of the CP system.

DATASHEET

CU/CUSO4 REFERENCE
ELECTRODE



STANDARD SPECIFICATION	
Electrolyte	Saturated Copper Sulphate Gel (98.4% Min Purity Cu/SO ₄ crystals)
Electrode Body Materials	High Temperature Fired Ceramic and Ion Trap.
Weight (Gross)	Approx 1Kg net weight
Dimensions	Approx 36mm Dia x 200mm (Bare Dimensions)
Cable	1c x 16mm ² XLPE/PVC stranded copper conductor cable, 600/1000V grade, black, 300m length For Crude Oil Tanks / 160m Long for Fire Water Tanks

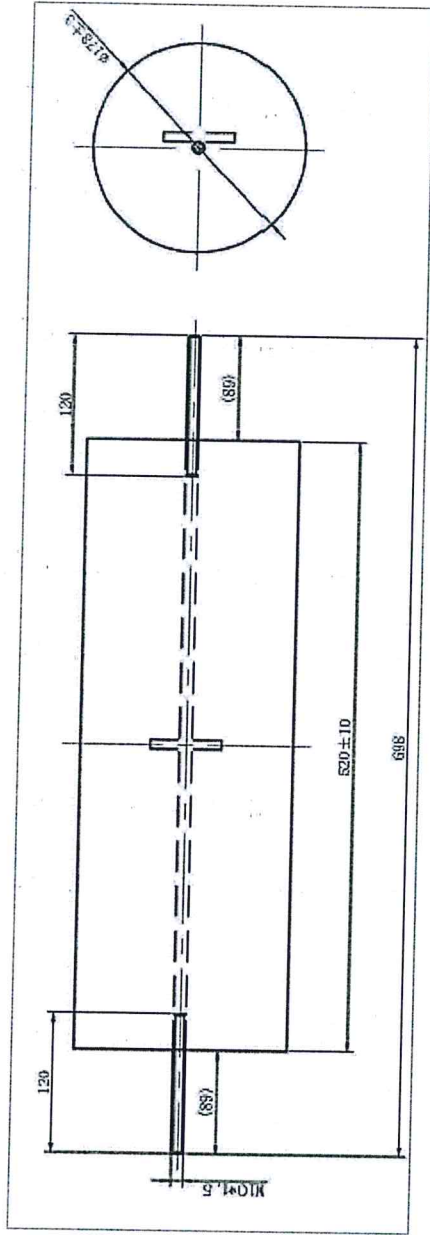
Quantity : 783 No for Crude Oil Storage Tanks
42 No for Fire Water Tanks

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CORROSION CONTROL

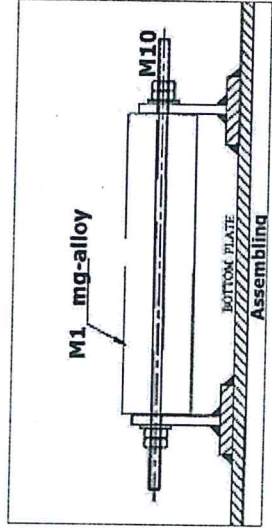
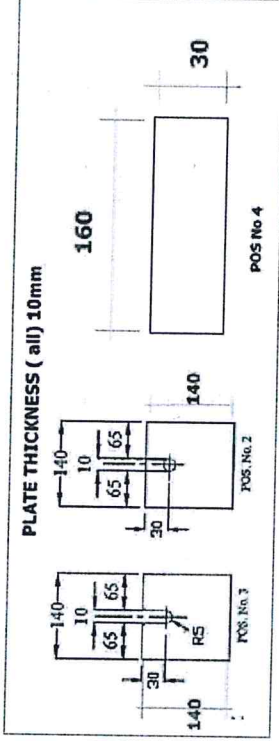
BAC Corrosion Control Ltd
Stafford Park 11 • Telford • TF3 3AY
United Kingdom

T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com



ALLOY COMPONENTS

Cu	0.03	MAX
Al	5.3	— 6.7
Si	0.3	MAX
Fe	0.005	MAX
Mn	0.25	Max
Ni	0.03	MAX
Zn	2.5—3.5	
Pb	0.03	MAX
Mg	Remainder	



BAC[®]

CORROSION CONTROL

170 Series Digital Multimeters

Versatile meters for field service or bench repair

These meters have the features needed to find most electrical, electro-mechanical and heating and ventilation problems. They are simple to use and have significant improvements over Fluke's original 70 Series like, True-RMS, more measurement functions, conformance to the latest safety standards, and a much larger display that's easier to view.

Features

True-RMS measurements			
179	AC	6000	33-segments
177	AC	6000	33-segments
175	AC	6000	33-segments
Digital display counts, updates 4 times per second			
Display backlight			
Analog bargraph / segments, updates 40 times per second			
Auto and Manual ranging			
Display Hold and AutoHOLD [®]			
Min-Max-Average recording mode with Min/Max Alert			
Temperature readings (lead thermocouple probe included)			
Smoothing mode allows filtering of rapidly changing inputs			
Audible continuity and diode test			
Test lead alert			
Unsafe voltage alert warns for voltages above 30V			
Low battery indication			
Ergonomic case with integrated holster			
Easy battery and fuse exchange without opening the complete case			
Selectable sleep mode preserves battery life			

Specifications

Functions	Maximum	Max. resolution
Voltage DC	1000V	0.1mV
Voltage AC	1000V	0.1mV
Current DC	10A	0.01mA
Current AC	10A	0.01mA
Resistance	50M Ω	0.1 Ω
Capacitance	10000pF	1nF
Frequency	100kHz	0.01Hz
Temperature	-40°C/+400°C	0.1°C

Accuracies are best accuracies for each function

Battery Life: Alkaline, 200 hrs typical
Size (HxWxD): 190 mm x 85 mm x 45 mm

Weight: 0.42 kg
Lifetime Warranty

179	$\pm(1.0\%+2)$	$\pm(0.09\%+2)$	$\pm(1.0\%+3)$	$\pm(1.0\%+3)$	$\pm(1.5\%+3)$	$\pm(0.9\%+1)$	$\pm(1.2\%+2)$	$\pm(0.1\%+1)$	$\pm(1.0\%+10)$
177	$\pm(1.0\%+2)$	$\pm(0.09\%+2)$	$\pm(1.0\%+3)$	$\pm(1.0\%+3)$	$\pm(1.5\%+3)$	$\pm(0.9\%+1)$	$\pm(1.2\%+2)$	$\pm(0.1\%+1)$	$\pm(1.0\%+10)$
175	$\pm(1.0\%+2)$	$\pm(0.09\%+2)$	$\pm(1.0\%+3)$	$\pm(1.0\%+3)$	$\pm(1.5\%+3)$	$\pm(0.9\%+1)$	$\pm(1.2\%+2)$	$\pm(0.1\%+1)$	$\pm(1.0\%+10)$

(Check the Fluke web for detailed specifications)

Recommended Accessories



Ordering Information
Fluke 175 True RMS Multimeter
Fluke 177 True RMS Multimeter
Fluke 179 True RMS Multimeter
Fluke 179/EDA2 Kit Electronics Combo Kit
Fluke 179/MAG2 Kit Industrial Combo Kit

10342-eng Rev. 08

Included Accessories
Test leads with 4 mm lantern tips and protective cap. The 179 also includes the 80BK temperature probe.



DATASHEET

1.31

CABLE

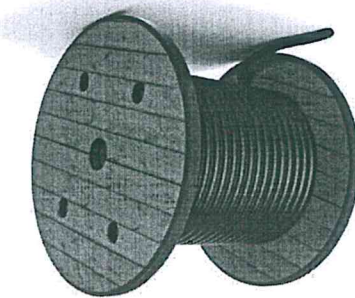


CABLE XLPE/PVC TYPE

BAC Corrosion Control Ltd supply a wide range of cables for Cathodic Protection systems.

We can advise you on the correct cable to use for your application and can cater for minimum order quantities, custom markings and insulation colour as required.

Our standard range of XLPE/PVC Cables are detailed as follows :



Quantity :
25,250m of 16mm² XLPE/PVC, Black
50,500m of 50mm² XLPE/PVC, Black

Conductor Size mm ²	Number of Strands	Nom O.D. (mm)	Approx Nett Weight (kg/km)
6	7	6.7	99
10	7	8.0	155
16	7	9.1	225
25	7	11.2	340
35	19	12.4	445
50	19	14.7	595
70	19	16.5	810
95	19	19.0	1110
120	37	20.6	1340

• **Insulation:** XLPE (Cross Linked Polyethylene) - Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability

• **Sheath:** PVC - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties. Can be supplied in Black or Red as standard.

• **Conductor:** Stranded or Solid Plain Annealed Copper.

• **Application:** Designed for use in cathodic protection systems. These cables are provided with PVC sheath for protection and are therefore suitable for external use and direct burial.

• **Technical Data:** Voltage: 600/1000V,

• **Temperature Range:** 20°C to +70°C

• **Relevant Standards:** Conductor: To BS6360 up to 35 mm²
To BS6346 above 50 mm²

• **Sizes and Dimensions**

All sizes and dimensions are approximate and for information only. BAC will confirm actual dimensions at time of order
if required:

CORROSION CONTROL



BAC Corrosion Control Ltd
Stafford Park 11 - Telford - TF3 3AY
United Kingdom

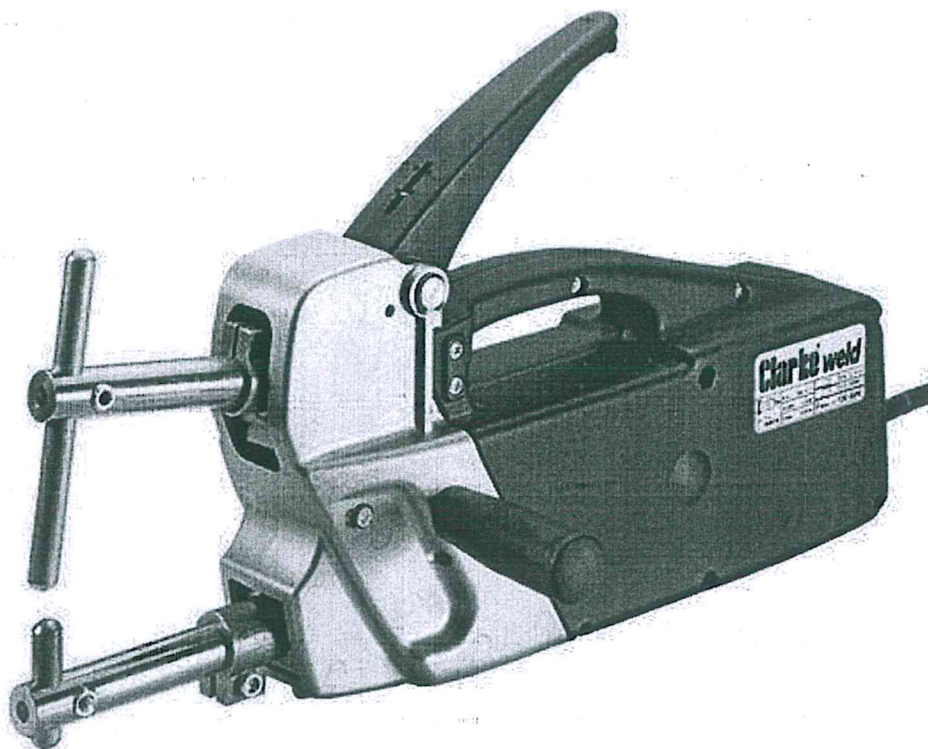
T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com

MIXED METAL OXIDE ANODES RIBBON TYPE SPOT WELDER

A portable spot welding kit that allows quick and easy connections between the MMO/Ti Ribbon Anode and Titanium Conductor Bar.

DATASHEET 1.11

SPOT WELDER



Quantity : 65 No

TECHNICAL SPECIFICATIONS	
Max. Welding Thickness (mm)	1+1
Input Voltage	230 V
Dimensions	440x110x185 mm
Rated Power	1.2 kW
Max. Absorbed Power	6 kW



CORROSION CONTROL

M MEMBER OF
MIDROC EUROPE



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.03- Motor Datasheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

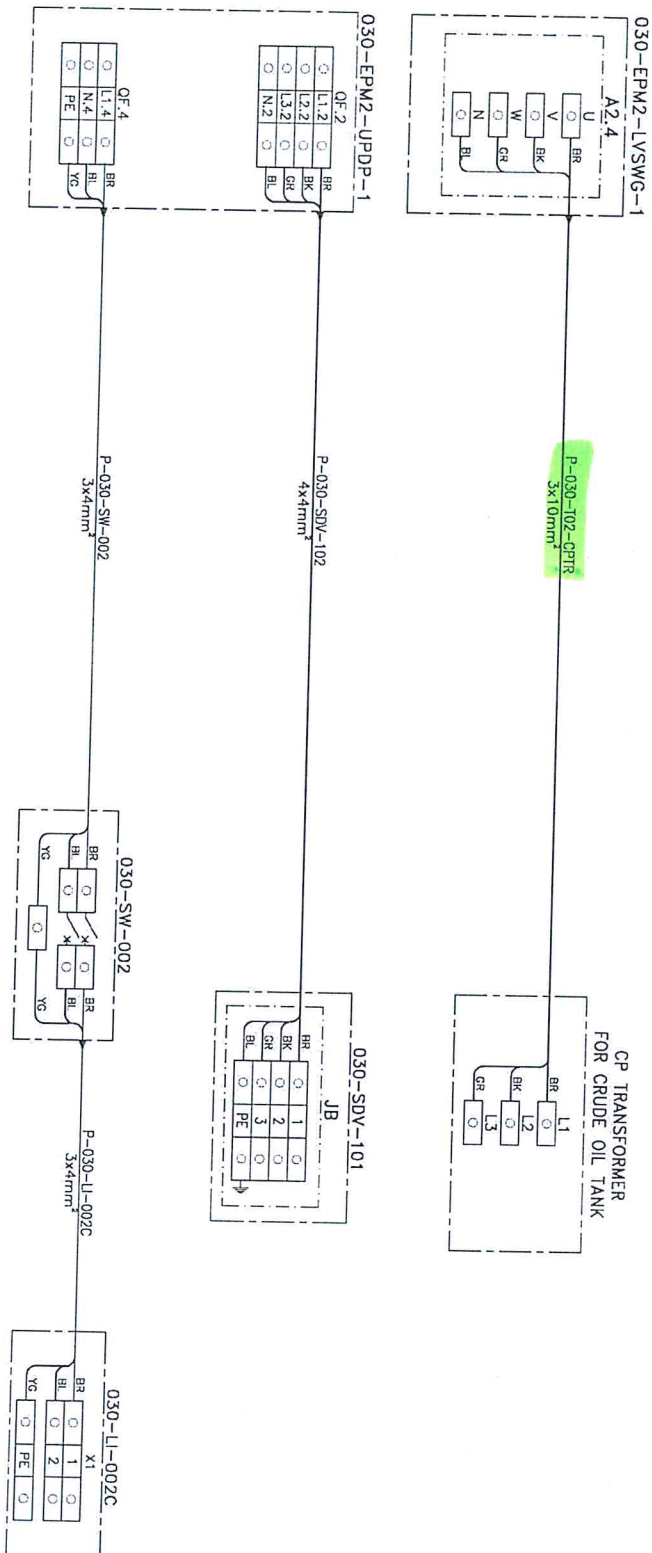
12.04- Electrical Cables Schedule

GE+AI:L	Cable Mark	GL1	FROM	TO	GL2	CABLEService	Service Voltage	KV	Size	Type	L
51	P-030-T02-CPTR	WP	030-EDM2-LVSWG-1 (A2.4)	CP Transformer for Crude Tank	WP	3PH POWER FEEDER	400VAC	15	3x10	3C	130

ELECTRICAL POWER MODULE

MCC ROOM

FIELD



EGPC
THE EGYPTIAN GENERAL PETROLEUM CORPORATION (EGPC)
EGPC
الهيئة العامة للغازات البترولية
لجنة المراجعة الفنية للرسومات
المراجعة: 01/251-100-030-EWI-001
التاريخ: 07/2008
AS 2012 2012

EGPC CRUDE OIL TANK FARM
ASBOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-2 AUXILIARIES
(030-1-02)
الشركة العامة للغازات البترولية والكهرباء

Enppi
ENGINEERING FOR THE PETROLEUM AND PROCESS INDUSTRIES

SCALE: NONE
DOCUMENT NUMBER: 01251-100-030-EWI-001
SUBJECT: 06/07/08
REVISION: 0

AS 2012 2012



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.05- Electrical Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID 030-CP-003

System Description Tank-02 Cathodic Protection System

12.06- Electrical Cables Testing Certificates



Enppi

EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER

PTJ-EL-RFI-

INSTRUMENT TYPE:

HIGH VOLTAGE INSULATION TESTER-SANWA-MG5000

INSPECTION DATE & TIME

03/07/2021 ITR-EL-0006A

SERIAL:

17015900385

SERVICE VOLTAGE: 400

TEST VOLTAGE: 1000

DISCIPLINE

ELECTRICAL

SHEET NO

AREA / PACKAGE:

SUBSTATION

SUBSTATION														
NO	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE			PHASE TO NEUTRAL "M.Ohm"			PHASES & NEUTRAL TO ARMOR "M.Ohm"			RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass
1	P-AG030-TR-002	3x10												
2	N1-030-EPM2-LTG	3x10	✓	0.1	0.1	0.1								✓
3	P-030-T02-CPTR	3x10	✓											
4	P1-030-EPM2-CR-1	3x16	✓											✓
5	P-030-SW-002	3x4	✓											✓
6	P-030-LI-002C	3x4	✓											✓
7	M-030-MXXM-02A	3x50	✓											✓
8	M-030-MXXM-02B	3x50	✓											✓
9	M-030-MXXM-02C	3x50	✓											✓
10	M-030-MXXM-02D	3x50	✓											✓
11	M-030-MXXM-02E	3x50	✓											✓
12	M-030-MXXM-02F	3x50	✓											✓
13	M-030-MXXM-02A, JB	3x95	✓											✓
14	M-030-MXXM-02B, JB	3x95	✓											✓
15	M-030-MXXM-02C, JB	3x95	✓											✓
16	M-030-MXXM-02D, JB	3x95	✓											✓
17	M-030-MXXM-02E, JB	3x95	✓											✓
18	M-030-MXXM-02F, JB	3x95	✓	0.1	0.1	0.1								✓

Remarks :-

Reference :-

NAME :	PETROJET	Enppi	PMC
SIGNATURE			
DATE			

ITR-EL-0006A



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)




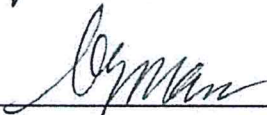
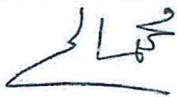
System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.07- Electrical Cables Termination Certificates



EGPC

Document No: ITR-QC-0001
Revision No. : 00

	PETROJET	ENPPI	PMC
NAME :	Moustafa Ibrahim	Ayman Baker	د. محمد ابراهيم محمد
SIGNATURE			
DATE	13-6-2020.	13-06-2020	د.د. 17/11

ITR-QC-0001



EGPC CRUDE OIL TANK FARM AGROOD
AREA (MODULE 1 & 2)



PETROJET
The Petroleum Projects and
Technical Consultations Co.
One of the Egyptian General Petroleum Corporation
Companies

INSPECTION AND TEST REPORT FOR

MMO RIBBON & CONDUCTOR BAR.

INSPECTION REPORT NUMBER
PTJ-ELE-RFI 12

INSPECTION DATE & TIME

DOCUMENT No.
ITR-CP-0001

DISCIPLINE
ELECTRICAL

SHEET NO
1 OF 1

JOB DESCRIPTION

EXTERNAL CATHODIC PROTECTION SYSTEM FOR CRUDE OIL TANK

AREA DESCRIPTION

ITEM / TAG NO.

030-T-02

DRAWING NO.

01251-100-116-002-D99-003

LOCATION

AGROUD AREA - MODULE 01

NO.	INSPECTION	RESULT		
		ACCEPT	REJECT	N/A.
1	Anode installation area free from metallic debris prior to installation and level	✓		
2	Anode visually inspected for damage prior to installation	✓		
3	MMO Ribbon installed as relevant drawing	✓		
4	Conductor Bar installed as relevant drawing	✓		
5	Continuity test shall be conducted between Conductor bar and MMO anode prior to backfilling	✓		
6	All spot welding at crossing locations visually inspected and checked	✓		
7	Power feed connectors installed at correct locations as relevant drawing	✓		
8	Power feed cables have no physical damage with sufficient slack cable to permit exit from ring beam and termination in junction box	✓		
9	Continuity test shall be conducted for all Power feed cables before and after backfilling.	✓		
10	No Interference or contact with the tank external surfaces	✓		
11	Cable routing	✓		
12	Carefully backfill sand over anode to required depth under the tank which is free from rocks, boulders and metallic debris	✓		
13	Output current measurement at power feed cables			✓
14	Waste materials removed from site	✓		

REMARKS:

PETROJET	ENPPI	PMC
NAME: Mostafa Ibrahim	Ayman Bakr	محمد إبراهيم محمد
SIGNATURE 		
DATE 13-6-2020	13-06-2020	17/11

ITR-CP-0001



EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE 1 & 2)



Owner: Egyptian General Petroleum Corporation (EGPC)

Project No: 01251-100-030
:01251-100-031

Contractor: CONSORTIUM (ENPPI / PETROJET)

Document No: ITR-QC-0001
Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY: PERMANENT REFERENCE ELECTRODE & MONITORING PIPE

NOTIFICATION NO. : PTJ-ELE-RFI-016 DISCIPLINE: CATHODIC PROTECTION

DATE: 23/6/2020

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
	PERMANENT REFERENCE ELECTRODE & MONITORING PIPE	030-T-02	23/6/2020	(A)	(A)	(A)	

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME:	Mostafa Ibrahim	Byman Bekair	محمد ابراهيم محمد
SIGNATURE			
DATE	23-6-2020	23-06-2020	23-6-2020

ITR-QC-0001



EGPC CRUDE OIL TANK FARM AGROOD
AREA (MODULE 1 & 2)



PETROJET
The Petroleum Projects and
Technical Consultations Co.
One of the Egyptian General Petroleum Corporation
Companies

INSPECTION AND TEST REPORT FOR

PERMANENT REFERENCE ELECTRODE & MONITORING PIPE

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	DOCUMENT No. ITR-CP-0002	DISCIPLINE ELECTRICAL	SHEET NO 1 OF 1
--------------------------	------------------------	-----------------------------	--------------------------	--------------------

JOB DESCRIPTION CATHODIC PROTECTION SYSTEM	AREA DESCRIPTION 030-T-02	
ITEM / TAG NO. 030-T-02-CP	DRAWING NO. 1251-100-116-02-XX-D99-023	LOCATION AGROOD AREA MODULE 01

NO.	INSPECTION	RESULT		
		ACCEPT	REJECT	N/A.
1	RE visually inspected for damage and tested prior to installation	✓		
2	Location of reference electrode correct	✓		
3	Location of monitoring tube correct	✓		
4	Reference electrode calibration test – measure potential to a calibrated portable CSE RE immersed in fresh water along with the permanent RE to be tested.	✓		
5	Elevation of reference electrode (m) as relevant drawing	✓		
6	Monitoring tube installed straight and free from inside obstructions	✓		
7	Reference electrode quantity as relevant drawing	✓		
8	Reference electrode spacing	✓		
9	Carefully selected backfill installed around anode which is free from rocks, boulders and metallic debris	✓		
10	Structure-to-electrolyte potential recorded with the permanent reference electrode			✓
11	Cables have no physical damage with sufficient slack cable to permit removal of terminated cables from terminals	✓		
12	Reinstatement completed and waste materials removed from site	✓		

REMARKS:

PETROJET	ENPPI	PMC
NAME: Mostafa Ibrahim	Byman Kakeir	محمد عبد الحليم
SIGNATURE 		
DATE 23-6-2020	23-06-2020	c.c. 17/6

**Enppi****EGPC CRUDE OIL TANK FARM**Owner : **Egyptian General Petroleum Corporation (EGPC)**Project No: 01251-100-030
:01251-100-031Contractor **CONSORTIUM (ENPPI / PETROJET)**Document No: ITR-QC-0001
Revision No. : 00**REQUEST FOR INSPECTION**ACTIVITY : **CABLE TERMINATION AND TEST**NOTIFICATION NO. : **PTJ-ELE-RFI-** DISCIPLINE : **ELEC**DATE : **03/07/2021**

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
18	M-030-MXM-02C	FIELD					
19	C1-030-MXM-02C	FIELD					
20	C3-030-MXM-02C	FIELD					
21	M-030-MXM-02D, JB	FIELD					
22	M-030-MXM-02D	FIELD					
23	C1-030-MXM-02D	FIELD					
24	C3-030-MXM-02D	FIELD					
25	M-030-MXM-02E, JB	FIELD					
26	M-030-MXM-02E	FIELD					
27	C1-030-MXM-02E	FIELD					
28	C3-030-MXM-02E	FIELD					
29	M-030-MXM-02F, JB	FIELD					
30	M-030-MXM-02F	FIELD					
31	C1-030-MXM-02F	FIELD					
32	C3-030-MXM-02F	FIELD					
33	P-030-T02-CPTR	FIELD					
34	P-030-SDV-102	FIELD					
35	P-030-SW-002	FIELD					
36	P-030-LI-002C	FIELD					

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-QC-0001



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:

INSPECTION REPORT NUMBER

INSPECTION DATE & TIME

ITR NUMBER

DISCIPLINE

SHEET NO

PTJ-ELE-RFI-

03/07/2021

ITR-EL-0009

ELEC

1 OF 1

Item/Tag NO.

For All Cables tags in PTJ-ELE-RFI-

Type :-

Core:

Size:

NO.	Description of check	RESULT		
		ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *1	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *11			✓
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications	✓		
9	Check enclosure cover is installed, no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.	✓		

Remarks :

*1 : ITR-EL-006A/B

*11 : ITR-EL-008

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-EL-0009



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.08- FAT Reports & Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.09- SAT Reports & Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.10- Electrical Pre-Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

12.11- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

13- Electrical Commissioning

System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

13.01- Electrical -Commissioning Check Lists

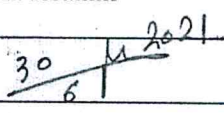
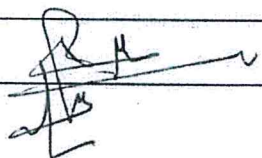
Cathodic Protection Commissioning Report

PROJECT	EGPC STORAGE TANKS	
LOCATION	AGROOD	
CLIENT	PMC	
SUPPLIER	PETROJET	
MANUFACTURE	BAC	
TANK SERVICE	TANK 30-TK-02	
Pre-Commissioning Check Sheet for Transformer Rectifier Unit		
CHECK LIST	TEST / CHECK REPORT	
Transformer Rectifier Unit / Location	OUTSIDE BUND WALL	
Rectifier Manufacturer	BAC	
Rectifier Type / Serial Number	OIL COOLD	
Rectifier Rating	AC Input	3 PHASE
	DC Output	50 A /150 A
All Cables (AC / DC) are properly terminated identified with proper tagging	OK	
Transformer Rectifier is properly grounded to the earthing system.	OK	
Oil Gauge, Silica Gel Breather & Fuse are properly fixed and secured without any damages.	OK	
T/R Unit is filled with suitable type of cooling oil at the required level.	OK	
Confirm TRU enclosure is earthed properly	OK	
Remarks		

	COMPLETED BY	WITNESSED BY
Company	PETROJET	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	30/6/2021	
Date	30/6/2021	

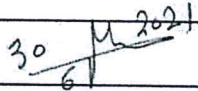
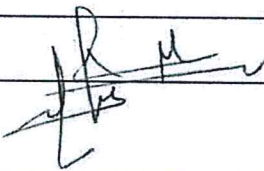
Cathodic Protection Commissioning Report

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-02
Pre-Commissioning Check Sheet For Junction Boxes (Anode Junction Boxes)	
CHECK LIST	TEST / CHECK REPORT
Confirm Location	Outside Bund Wall
Physical Condition (Internally & Externally)	OK
Number of Circuits	17
Junction box is properly mounted and secured on the frame	OK
All cables are properly terminated inside the junction box unit	OK
Remarks.	17 circuits divided into 2 anode junction boxes: - - 10 and 7

	COMPLETED BY	WITNESSED BY
Company	<i>PETROJET</i>	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature		
Date	30/6/2021	

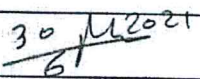
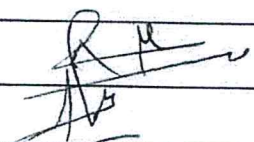
Cathodic Protection Commissioning Report

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-02
Pre-Commissioning Check Sheet for Test Posts (Galvanized Steel Type)	
CHECK LIST	TEST / CHECK REPORT
Test Post Location	Outside Bund Wall
Number of Cables Terminated	23
Physical Condition (Internally & Externally)	OK
Test Post is properly mounted and secured on the test post conduit.	OK
All cables are properly terminated inside the big fink.	OK
Remarks	23 circuits divided into 5 test points 4 TP.1 - 5 TP.2 - 5 TP.3 - 5 TP.4 - 4 TP.5

	COMPLETED BY	WITNESSED BY
Company	PETROJET	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature		
Date	30/6/2021	

Cathodic Protection Commissioning Report

PROJECT	EGPC STORAGE TANKS			
OWNER	PMC			
SUPPLIER	PETROJET			
MANUFACTURE	BAC			
TANK SERVICE	Crude Oil Storage Tank 30-TK-02			
Commissioning Check Sheet For Structure-To-Soil Potential Measurement (Test Post Location)				
Test Post location				
TEST NO.	TEST FACILITY		POTENTIAL	REMARKS
	TYPE	Location	ON - POTENTIAL V	
1	GALVANIZED STEEL	OUTSIDE BUND WALL	-1 / -1.3 / -1.3 / -0.85	Accept
2	GALVANIZED STEEL	OUTSIDE BUND WALL	-1 / -1.4 / -1.4 / -1.4 / -1	Accept
3	GALVANIZED STEEL	OUTSIDE BUND WALL	-1.25 / -1.3 / -1.4 / -1.4 / -1.3	Accept
4	GALVANIZED STEEL	OUTSIDE BUND WALL	-1 / -1.4 / -1.4 / -1.4 / -1.14	Accept
5	GALVANIZED STEEL	OUTSIDE BUND WALL	-1 / -1.3 / -1.4 / -1	Accept
Reference Electrode (Type): CU/CUSO4				
General Notes:				
<p>The system is working with high efficiency and properly . The power source is temporary and the final commissioning will be done after the permanent source is connected.</p>				

	COMPLETED BY	WITNESSED BY
Company	PETROJET	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature		
Date	30-6-2021	



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

13.02- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

14- Red Marked-up Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

14.01- P&ID



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

14.02- Instrumentation Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-CP-003
System Description	Tank-02 Cathodic Protection System

14.03- Electrical Drawings